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09/639,684	08/15/2000	Dennis H. Runnoe	14374.14	4147

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EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/639,684

Applicant(s)

RUNNOE, DENNIS H.

Examiner

Courtney Thomas

Art Unit

2882

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 28-56 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-22 and 28-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5-7, 11-16, 18, 28-39 and 41-56 are rejected under 35 U.S.C. 102(b) as being anticipated by DeCou, Jr. et al. (U.S. Patent 5,264,801).

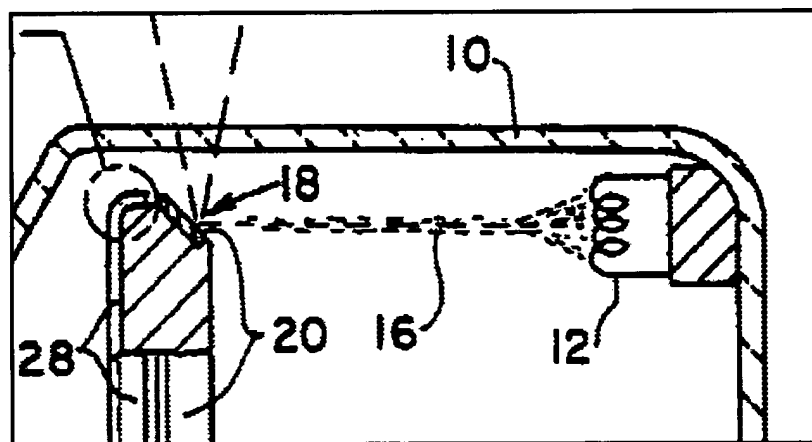
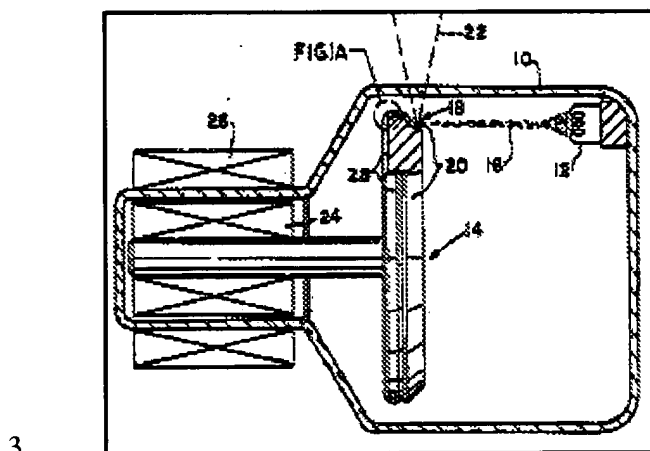


Figure 1 - U.S. Patent 5,264,801 to DeCou, Jr. et al.

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5. **As per claims 1, 5, 28, 29, 30, 44 and 53**, DeCou, Jr. et al. disclose an x-ray device, comprising:

6. (a) a vacuum enclosure (10),

7. (b) an integral cathode disposed in said vacuum enclosure (note: column 1, lines 14-15 and 17-19, column 2, lines 45-47) said integral cathode including an emitter (12) capable of discharging electrons (16), the emitter having a predetermined geometrical configuration oriented to cause some of the discharged electrons to converge to a focal spot (18);

8. (c) a power source (not shown above - however, DeCou Jr., et al. disclose the emission of electrons upon the application of DC potential - see also column 2, lines 61-65) connected to said emitter so that transmission of power from said power source to said emitter causes said emitter to discharge electrons;

9. (d) a target anode (14) disposed in said vacuum enclosure and having a target surface positioned to receive at least some of the electrons discharged by said emitter;

10. (e) a support cartridge, providing structural support for the emitter (see Fig. 1, above) and

11. (e) wherein the emitter (12) has a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot (see Fig. 1, above; see also column 2, lines 61-65).

12. **As per claims 2 and 6**, DeCou, Jr. et al. disclose an x-ray device wherein the focal spot (18) is located proximate to the target surface of said target anode (14); (see Fig. 1 above).

13. **As per claims 3 and 7**, DeCou, Jr. et al. disclose an x-ray device further comprising a support cartridge (not labeled), the support cartridge receiving the emitter and maintaining the emitter in a desired geometrical configuration.

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14. As per claims 11-16, 18, 31-39, 41-43, 45-52 and 54-56 DeCou, Jr. et al. disclose an x-ray device wherein the support cartridge comprises at least one conductive portion, the electron beam and focal spot being selectively manipulated by the application of a voltage to the at least one conductive portion (i.e. Fig.1), the emitter comprises a plurality of subsidiary emitting portions integral with each other, at least two subsidiary emitting portions not being parallel to each other while cooperating to facilitate the convergence of at least some of the discharged electrons (see Fig. 1 above), wherein the at least two subsidiary portions are integral with each other and are disposed in a substantially "V" shaped configuration (see also Fig. 1 above); wherein a plurality of cut out portions are defined in the emitter, the plurality of cutout portions collectively defining an electrical current path; the emitter substantially comprises a single piece of emissive material, at least one of a subsidiary emitting portion is substantially planar, at least one of a subsidiary emitting portions substantially comprise a geometry selected from the group consisting of parabolic and spherical sections (see Fig. 1 above and respective portions of the specification).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 9, 10 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801).

17. **As per claims 9, 10 and 40** DeCou, Jr. et al. do not explicitly disclose an x-ray device wherein the emitter is substantially composed of a refractory metal or composed of a combination of tungsten and rhenium. One would have been motivated to make such a modification, however, for the purpose of providing an emitter having good emissive characteristics and thermal stability when utilized in elevated temperature environments. Additionally, the selection of suitable/ superior (emitter) materials is a well-known practice/ technique in the x-ray tube art.

18. Claims 4 and 19-22 rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) in view of Knudsen et al. U.S. Patent 5,515,413.

19. **As per claims 4 and 19-22**, DeCou, Jr. et al do not explicitly disclose a support cartridge (that) facilitates substantial electrical isolation of the integral cathode. It would have been obvious to a practitioner in the art to provide a support for an integral cathode wherein the support cartridge was substantially electrically non conductive. One would have been motivated to make such a modification for the purpose of preventing electrical shorting of the device during operation through inadvertent contact with nearby conductive elements. Additionally, the selection of suitable/ superior insulating materials (i.e. ceramics (alumina, zirconia) glass, etc. for use in an elevated temperature environment) is a well-known practice/ technique in the x-ray tube art (see also Knudsen et al. U.S. Patent 5,515,413 - column 2, lines 32-61).

20. Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) in view of Reinhold (U.S. Patent 4,573,186).

21. **As per claim 17**, DeCou, Jr. et al do not explicitly disclose an apparatus wherein the emitter is substantially bowl shaped.

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22. Reinhold discloses an apparatus wherein the emitter (3) is substantially bowl shaped (see Fig. 2).

23. It would have been obvious to modify the apparatus of DeCou, Jr. et al. such that it incorporated an emitter that is essentially bowl shaped. One would have been motivated to make such a modification so that electron emission is finely focused, due to the shape of the emitter thereby resulting in an increase in the resolving power of an X-ray apparatus as suggested by Reinhold (see abstract; also column 1, lines 15-26).

***Allowable Subject Matter***

24. Claim 8 is allowed.

25. The following is a statement of reasons for the indication of allowable subject matter:

26. **As per claim 8**, the examiner found no reference in the prior art that disclosed or made obvious an X-ray device comprising an emitter capable of discharging electrons, the emitter having a predetermined geometrical configuration oriented to cause some of the discharged electrons to converge to a focal spot; **wherein the predetermined geometrical configuration provides an emitter having a cross section substantially in the shape of an arc so that a concave side of the emitter is directed toward the target surface of a target anode.**

***Response to Arguments***

27. Applicant's arguments filed 11/17/2003 have been fully considered but they are not persuasive.

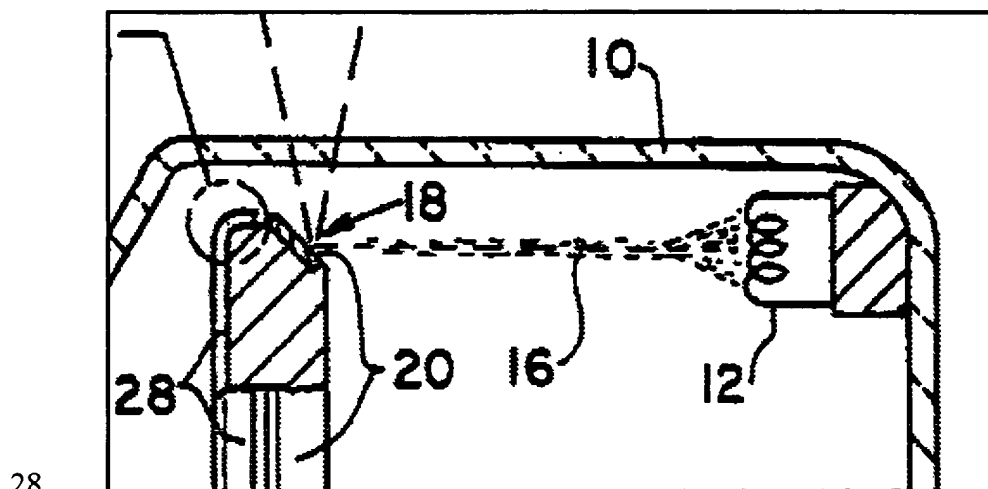


Figure 2 - U.S. Patent 5,264,801 to DeCou, Jr. et al.

- 29.
1. (Previously presented) An x-ray device, comprising:
    - (a) a vacuum enclosure;
    - (b) an integral cathode disposed in said vacuum enclosure, said integral cathode including an emitter capable of discharging electrons, said emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge at a focal spot;
    - (c) a power source connected to said emitter so that transmission of power from said power source to said emitter causes said emitter to discharge electrons; and
    - (d) a target anode disposed in said vacuum enclosure and having a target surface positioned to receive at least some of the electrons discharged by said emitter.

**Claim 1 (as submitted on 11/17/2003) - U.S. Patent Application 09/639,684 to Runnoe**

30. In particular, DeCou Jr., et al. (U.S. Patent 5,264,801) disclose an X-ray device comprising a vacuum enclosure (10), an integral cathode having an emitter (12), the emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons (16) to converge to a focal spot (18), a power supply (not shown above - DeCou Jr., et al. disclose the emission of electrons upon the application of DC potential - see



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also column 2, lines 61-65), and a target anode (14) (Examiner notes that numeral 14 is not visible in the enlarged portion of Fig. 1 above) disposed in the vacuum enclosure (10) and having a target surface (20) positioned to receive at least some of the electrons (16) discharged by the emitter (12).

31. Applicant contends that DeCou Jr. et al. (Patent '801) fails to teach, at least the limitation concerning an emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot and consequently is not a reference to be utilized in a rejection under 35 USC 102b. Applicant further traverses the application of DeCou Jr. et al. to pending claims 1-7, 9-22 and 28-56.

32. Examiner believes however, DeCou Jr., et al. (Patent '801) rightly meets the requirements for a 35 USC 102b rejection, since every element set forth in the claim is found, either expressly or inherently (compare claim language to DeCou Jr., et al. Fig. 1 above). Furthermore, Examiner has applied procedures commensurate with MPEP 2111 and 2111.01 during the examination of the current application and has concluded that the apparatus of DeCou Jr., et al. anticipates Applicants invention as claimed, including the limitation of an emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot, since this feature is readily seen in Fig.1 of DeCou Jr. et al (see above).

33. Based on the above, Examiner concludes that Applicants arguments are not persuasive, since DeCou Jr. et al. meet every element set forth in the pending independent claims, including the limitation of an emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot.

***Conclusion***

34. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (571) 272-2496. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272 2490. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1550.

CT  
Courtney Thomas

  
DAVID V. BRUCE  
PRIMARY EXAMINER